

MONTHLY NOTICES
OF THE
ROYAL ASTRONOMICAL SOCIETY.

VOL. XXXIII. February 14, 1873. No. 4.

PROFESSOR CAYLEY, F.R.S., President, in the Chair.

Carl Behrens, Esq., Durban, Natal,
Ernest Carpmael, Esq., St. John's College, Cambridge,
Harris Hills, Esq., Feering House, Kelvedon, Essex,
Wm. J. Lewis, Esq., Oriel College, Oxford,
Adolph Lindemann, Esq., 3 Great George Street, Westminster,
D. A. Marsden, Esq., 65 Lincoln's Inn Fields; and
Edmund Neison, Esq., 37 Fellowes Road, N.W.,

were balloted for and duly elected Fellows of the Society.

Report of the Council to the Fifty-third Annual General Meeting of the Society.

Progress and present state of the Society:—

	Compounders.	Annual Contributors.	Non-residents.	Patrons, and Honorary.	Total Fellows.	Associates.	Grand Total.
December 31, 1871	192	304	9	3	508	44	552
Since elected ...	+ 5	+ 26	+ 8	...
Deceased	— 6	— 2	...	— 1	...	— 4	...
Removals	+ 2	— 2
Resigned	— 5
Dec. 31, 1872 ...	193	321	9	2	525	48	573

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Mr. Whitbread's Account as Treasurer of the Ro

RECEIPTS.

1872.

		£	s.	d.	£	s.
	Balance of last year's account		271	13
Jan. 6	By Dividend on £3400 Consols	...	...	49 14 6		
Apr. 6	By ditto on £5200 New 3 per Cents	...	...	76 1 0		
July 6	By ditto on £3600 Consols	...	...	53 2 0		
Oct. 7	By ditto on £5200 New 3 per Cents	...	...	76 14 0		
				<hr/>	255	11
	Received for arrears of contributions	...	...	188 19		
	Annual contributions	...	...	388 10		
	28 Admission-fees	...	...	58 16		
	First years' contributions	...	...	44 2		
				<hr/>	680	7
	8 compositions	...	...	...	168	0
	Sale of publications:—					
	At the Rooms of the Society	...	...	10 6 0		
	By Messrs. Williams and Norgate	...	...	19 16 5		
				<hr/>	30	2

£1405 14

Astronomical Society, from January 1 to December 31, 1872.

EXPENDITURE.

Salaries :—				£	s.	d.	£	s.	d.
Editor of Monthly Notices	...	...	...	60	0	0			
Assistant Secretary	...	...	...	130	0	0			
Commission on Collecting	...	...	...	34	9	0			
							224	9	0
Taxes :—				£	s.	d.			
Land and Assessed	...	...	...	7	1	3			
Income	...	...	...	2	16	6			
Poor Rate	...	...	...	10	19	4			
Other Parish Rates	...	...	...	6	5	4			
							27	2	5
Bills :—				£	s.	d.			
Strangeways, printer	...	...	...	320	3	6			
Metcalf, engraving	...	...	...	3	13	6			
Taylor & Co. „	...	...	...	2	13	6			
Wesley, „	...	...	...	9	8	6			
Rumfitt, bookbinder	...	...	...	17	3	9			
Sun Fire Office Insurance	...	...	...	7	15	6			
Browning, instrument-maker	...	...	...	1	4	6			
Grubb, „	...	...	...	5	0	0			
Rev. C. Pritchard, for Sir J. Herschel's Catalogue	...	...	...	35	0	0			
Banks & Barry, plans	...	...	...	4	4	0			
W. Day, gratuity	...	...	...	5	0	0			
							411	6	9
Miscellaneous items :—				£	s.	d.			
House expenses	...	...	...	22	3	2			
Stamps and postages	...	...	...	40	11	1			
Books and parcels	...	...	...	5	9	9			
Expenses of evening meetings	...	...	...	17	10	0			
Coals and wood	...	...	...	12	0	0			
Gas	...	...	...	6	1	6			
Sundries	...	...	...	14	10	7			
Turnor Fund	...	...	...	0	11	0			
							118	17	1
Mrs. Jackson Gwilt's annuity, 1 year	...	...	...				8	15	10
Investment :—				£	s.	d.			
Purchase of £200 Consols at 93	...	...	...				790	11	1
Cheque book and banker's commission	...	...	...				186	5	0
							0	10	5
							977	6	6
Balance at Banker's	...	...	...				428	8	0
							£1405	14	6

Examined and found correct, Jan. 25, 1873,

(Signed)

H. PERIGAL,
W. T. LYNN,
ROBT. J. LECKY, } *Auditors.*

Assets and Present Property of the Society, January 1, 1873:—

	£	s.	d.	£	s.	d.
Balance at Banker's ... ..	...	...	...	428	8	0
3 Contributions of 8 years' standing	...	50	8	0		
2 " 7 " ...	...	29	8	0		
9 " 6 " ...	...	113	12	0		
4 " 5 " ...	...	42	0	0		
5 " 4 " ...	...	42	0	0		
6 " 3 " ...	...	37	16	0		
26 " 2 " ...	...	109	4	0		
47 " 1 " ...	...	98	14	0		
Balances of several Accounts	...	21	7	0		
				544	9	0
Due for Publications ... ..	...	...	...	17	10	0
£5200 New 3 Per Cents (including Mrs. Jackson Gwilt's Gift, £300).						
£3600 Consols, including the Lee Fund (£100) and Turnor Fund (£500).						
Unsold Publications of the Society.						
Various astronomical instruments, books, prints, &c.						
Balance of Turnor Fund (included in Treasurer's Account)				182	12	9

Stock of volumes of the *Memoirs*:—

Vol.	Total.	Vol.	Total.	Vol.	Total.
I. Part 1	8	XIV.	387	XXIX.	444
I. Part 2	48	XV.	170	XXX.	294
II. Part 1	66	XVI.	195	XXXI.	170
II. Part 2	30	XVII.	168	XXXII.	200
III. Part 1	82	XVIII.	173	XXXIII.	204
III. Part 2	101	XIX.	179	XXXIV.	189
IV. Part 1	99	XX.	176	XXXV.	161
IV. Part 2	101	XXI. Part 1	216	XXXVI.	247
V.	121	XXI. Part 2	100	(with M. N.)	
VI.	147	XXI.	86	XXXVI.	24
VII.	172	(together).		(without)	
VIII.	158	XXII.	179	XXXVII.	325
IX.	161	XXIII.	173	Part 1	
X.	171	XXIV.	179	XXXVII.	345
XI.	161	XXV.	193	Part 2	
XII.	186	XXVI.	197	XXXVIII.	358
XIII.	195	XXVII.	453	XXXIX.	414
		XXVIII.	412	Part 1	
				XXXIX.	472
				Part 2.	

The instruments belonging to the Society are as follows:—

The *Harrison* clock,
 The *Owen* portable circle,
 The *Beaufoy* circle,
 The *Beaufoy* transit,
 The *Herschelian* 7-foot telescope,
 The *Greig* universal instrument,
 The *Smeaton* equatoreal,
 The *Cavendish* apparatus,
 The 7-foot Gregorian telescope (late Mr. Shearman's),
 The Variation transit (late Mr. Shearman's),
 The Universal quadrant by Abraham Sharp,
 The *Fuller* theodolite,
 The Standard scale,
 The *Beaufoy* clock, No. 1,
 The *Beaufoy* clock, No. 2,
 The *Wollaston* telescope,
 The *Lee* circle,
 The *Sharpe* reflecting circle,
 The *Brisbane* circle,
 The *Baker* universal equatoreal,
 The *Reade* transit.

The *Sheepshanks'* collection of instruments, viz.,—

1. 30-inch transit, by Simms, with level and two iron stands.
2. 6-inch transit theodolite, with circles divided on silver; reading microscopes, both for altitude and azimuth; cross and siding levels; magnetic needle; plumbline; portable clamping foot and tripod stand.
3. $4\frac{6}{10}$ -inch achromatic telescope, about 5 feet 6 inches focal length; finder, rack motion; double-image micrometer; two other micrometers; one terrestrial and ten astronomical eyepieces, applied by means of two adapters, with equatorial stand and clock movement.
4. $3\frac{1}{4}$ -inch achromatic telescope, with equatorial stand; double-image micrometer; one terrestrial and three astronomical eyepieces.
5. $2\frac{3}{4}$ -inch achromatic telescope, with stand; one terrestrial and three astronomical eyepieces.
6. $2\frac{3}{4}$ -inch achromatic telescope, about 30 inches focus; one terrestrial and four astronomical eyepieces.
7. 2-foot navy telescope.
8. 45-inch transit instrument, with iron stand, and also Y's for fixing to stone piers; two axis levels.
9. Repeating theodolite, by Ertel, with folding tripod stand.
10. 8-inch pillar-sextant, divided on platinum, with counterpoise stand and horizon roof.
11. Portable zenith instrument, with detached micrometer and eyepiece.

12. 18-inch Borda's repeating circle, by Troughton.
13. 8-inch vertical repeating circle, with diagonal telescope, by Troughton and Simms.
14. A set of surveying instruments, consisting of a 12-inch theodolite for horizontal angles only, with extra pair of parallel plates; tripod staff, in which the telescope tube is packed; repeating table; level collimator, with micrometer eyepiece; and Troughton's levelling staff.
15. Level collimator, plain diaphragm.
16. 10-inch reflecting circle, by Troughton, with counterpoise stand; artificial horizon, with metallic roof; two tripod stands, one with table for artificial horizon.
17. Hassler's reflecting circle, by Troughton, with counterpoise stand.
18. 6-inch reflecting circle, by Troughton, with two counterpoise stands, one with artificial horizon.
19. 5-inch reflecting circle, by Lenoir.
20. Reflecting circle, by Jecker, of Paris.
21. Box sextant and 3-inch plane artificial horizon.
22. Prismatic compass.
23. Mountain barometer.
24. Prismatic compass.
25. 5-inch compass.
26. Dipping needle.
27. Intensity needle.
28. Ditto ditto.
29. Box of magnetic apparatus.
30. Hassler's reflecting circle, with artificial horizon roof.
31. Box sextant and $2\frac{1}{4}$ -inch glass plane artificial horizon.
32. Plane speculum artificial horizon and stand.
33. $2\frac{1}{2}$ -inch circular level horizon, by Dollond.
34. Artificial horizon roof and trough.
35. Set of drawing instruments, consisting of 6-inch circular protractor; common ditto; 2-foot plotting scale; two beam compasses and small T square.
36. A pentagraph.
37. A noddy.
38. A small Galilean telescope, with the object lens of rock-crystal.
39. Six levels, various.
40. 18-inch celestial globe.
41. Varley stand for telescope.
42. Thermometer.
43. Telescope, with the object-glass of rock crystal.

To these must be added the following instruments which had been employed in the Observations of the Total Solar Eclipse of 1870, and which, by a resolution of the joint Eclipse Committee of 1870, were transferred to the Royal Astronomical Society:—

Portable equatoreal stand,
 Portable altazimuth tripod,
 Four polarimeters,
 Two Biquartz and Nicol's prisms,
 Registering spectroscope, with prism,
 Camera and chemicals, in box,
 Two five-prism spectroscopes,
 Cradle for telescope,
 Eight-inch reflector and stand,
 Spectroscope,
 A small box, containing—
 Three square-headed Nicol's prisms,
 Two Babinet's compensators,
 Two double-image prisms,
 Three Savarts,
 One positive eye-piece, with Nicol's prism,
 One dark wedge.

These are now in the apartments of the Society, with the exception of the following, which are lent, during the pleasure of the Council, to the several parties under mentioned, viz.:—

The *Fuller* theodolite, to the Director of the Sydney Observatory.

The *Beaufoy* transit, to the Observatory, Kingston, Canada.

The *Sheepshanks* instrument, No. 1, to Mr. Lassell.

Ditto ditto No. 2, to Mr. Huggins.

Ditto ditto No. 4, to Rev. C. Lowndes.

Ditto ditto No. 5, to Mr. Birt.

Ditto ditto No. 6, to the late Rev. J. Cape.

Ditto ditto No. 8, to Rev. C. Pritchard.

Ditto ditto No. 9, to the Director of the Sydney Observatory.

Ditto ditto No. 41, to Rev. C. Pritchard.

Ditto ditto No. 43, to Mr. Huggins.

The 6-inch circular protractor, to Mr. Birt.

Tripod stand. Mr. Chambers.

Lent on account of the Eclipse Expedition:—

One polarimeter. Mr. Ranyard.

One ditto. B. A. Eclipse Committee.

One Biquartz and Nicol's prism. Mr. Ranyard.

Camera and chemicals, in box. B. A. Eclipse Committee.

One five-prism spectroscope. B. A. Eclipse Committee.

One ditto. Mr. Lockyer.

Cradle for telescope. Mr. W. A. Harris.

PRINTED TRANSACTIONS OF THE SOCIETY.

Memoirs.

Part II. of Volume XXXIX. of the *Memoirs* has been published. This part which is paged in continuation of Part I. contains four Memoirs.

1. "Les Variations de la Pesanteur dans les Provinces Occidentales de l'Empire Russe." Par A. Sawitsch.

2. "On the Geodesic Lines on an Ellipsoid." By Professor Cayley, F.R.S.

3. "The Second Part of a Memoir on the Development of the Disturbing Function in the Lunar and Planetary Theories." By Prof. Cayley, F.R.S.

This paper is a sequel to a memoir published in Volume XXVIII. of the Society's *Memoirs*, and Prof. Cayley has therefore entitled it as above, but it, in fact, has reference only to the Planetary Theory.

4. "On the Law of Facility of Errors of Observations, and on the Method of Least Squares." By J. W. L. Glaisher, Esq., B.A.

Monthly Notices.

Some very important Papers have appeared in the *Monthly Notices* since the last Annual Report. Formerly, some of these would have been considered appropriate for insertion in the Volume of *Memoirs*. By placing them, however, in the Octavo Volume, an early publication is secured to the author, and consequently the results of any new research are laid before our home and foreign astronomers, without the delay which must necessarily arise when the Paper is reserved for the *Memoirs*. A few of the principal Papers printed in the *Monthly Notices* are made the subjects for special remark in another section of the Report.

The Council take this opportunity of drawing the attention of the Fellows to the great importance of recording in any Paper intended for publication in the *Monthly Notices*, full particulars of the telescope or instrument employed, together with any fact which might have an effect upon the observations. In most of the reports of astronomical observations which have been made to the Society, there has been an absence of sufficient detail, or enumeration of the circumstances under which the observations have been made, and hence much of their value is lost. The Council therefore recommend to the notice of those Fellows, or other gentlemen, who may favour them with such communications in future, the following suggestions in relation to them,—

When they are the results of telescopic observation, they should be accompanied by the following particulars. The form of telescope used should be stated—its aperture and focal length,—whether equatorially mounted or not, and the magnifying powers employed. If a drawing is sent—the result of a single

observation—the Greenwich or local time should be given with more or less accuracy, as well as the apparent clearness of atmosphere and state of the sky. If the result of a series of observations, some at least of the most remarkable should be selected, and the times, circumstances, and conditions of atmosphere when they were severally made, should be fully stated. If these particulars be generally noted and communicated, the value of such contributions will be greatly enhanced.

The Council, having duly considered that it would be for the interests of astronomy, and of the Society to distribute freely the Proceedings to non-members at a small charge, have resolved that in future the *Monthly Notices* may be obtained by application to the Assistant-Secretary, at the price of one shilling for each number, or ten shillings for the session, which in the latter instance includes the postage within the limits of the United Kingdom.

Government Aid to the Cultivation of the Physics of Astronomy.

After long and careful consideration of this subject, extending over four meetings, two of which were especially convened for the purpose, and including the discussion of points importantly affecting as well the interests of science as the dignity of this Society, your Council by a large majority passed the following resolutions on the 28th of June, 1872:—

1. That the President be authorised, on behalf of the Council and Fellows of the Royal Astronomical Society, to bring before the Royal Commissioners on Scientific Instruction and on the Advancement of Science now sitting, the importance of further aid being afforded to the cultivation of the Physics of Astronomy.

2. They think such aid would be most effectually given by increased assistance, where needed, to existing Public Observatories, in the direction recommended by the heads of those Observatories, especially that at the Cape of Good Hope, and by the establishment of a new Observatory on the Highlands of India, or in some other part of the British dominions where the climate is favourable for the use of large instruments.

3. The Council do not recommend the establishment of an independent Government Observatory for the cultivation of Astronomical Physics in England, especially as they have been informed that the Board of Visitors of the Royal Observatory at Greenwich, at their recent meeting, recommended the taking of photographic and spectroscopic records of the Sun at that Observatory.

OBITUARY.

The deaths of the following Fellows and Associates have been reported to the Council since the last Anniversary,—

Honorary Member :—Mrs. Mary Somerville.